

AIR UNIVERSITY



Operational Art

If we lose the war in the air, we lose the war and lose it quickly.

—Field Marshal Montgomery

The Airman's Role

1. Airmen are responsible for the effective employment of air and space power.

- An airman, acting as the joint forces air component commander (JFACC), should be responsible for employing all air assets in theater.
- The air component commander and JFACC should ensure that contingency operations and theater campaigns derive the maximum benefit from available air and space assets.

2. There is no universal formula for the proper employment of airpower in a campaign.

- The objective is the paramount consideration in every campaign.
- The relationship of both strategic and tactical objectives must be considered when developing the campaign objective.

3. Certain factors influence the airman's operational art and shape the campaign plan. Some of these are

- The nature of the enemy.
- The characteristics of the war.
- The nature and location of the theater.
- The availability of air and space assets.

4. The operational art of airpower is the planning for employment of air and space assets to maximize their contribution to the combatant commander's intent.

- Airpower may be employed independently of, or integrated with, surface operations.
- The air component commander's exercise of operational art involves four tasks:
 - Determining when and where to apply what force to fulfill the objectives.
 - Creating conditions to achieve success.
 - Readjusting operations based on mission results and the commander's revised intent.
 - Fully exploiting combat opportunities.

Airmindedness

1. "Airmindedness" is a perspective of military operations based on the characteristics of airpower and encompasses a broad view of military objectives.

- Two dimensional surface warfare concepts often dominate current military thinking.
- All aspects of warfare must be reexamined from an aerial or three dimensional perspective.
- Airpower is free of the barriers that impede surface forces.

2. Airmen should view the principles of war from an aerial perspective.

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| <ul style="list-style-type: none"> • Objective: airmen are not constrained to achieving tactical objectives as a prerequisite to obtaining strategic objectives. | <p>Air and space forces can pursue tactical, operational, or strategic objectives—or all three at the same time.</p> |
| <ul style="list-style-type: none"> • Offensive: air forces are inherently offensive—even when defending, they attack. | <p>Aggressive defeat of the enemy's air and space forces is the airman's first priority in warfare; it makes all other operations possible.</p> |
| <ul style="list-style-type: none"> • Unity of command: airpower is the product of multiple capabilities and centralized command and control is the key to fusing these capabilities. | <p>The misapplication of airpower is likely to have immediate strategic consequences.</p> |
| <ul style="list-style-type: none"> • Security: the lethality of airpower makes the security of friendly forces from enemy airpower a paramount concern. | <p>Security requires the elimination of the enemy's airpower threat.</p> |
| <ul style="list-style-type: none"> • Surprise: it depends on initiative and is made more attainable by the versatility of air and space power. | <p>Surprise is airpower's strongest advantage. Choice of time and place to attack always rests with the commander of superior air and space forces.</p> |

Compared to land and sea forces, terrain and distance are not inhibiting factors for air and space forces.

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| <ul style="list-style-type: none"> • Simplicity: planning, logistics, and administrative support are complex for all forces, but generally are less so for air and space forces. | <p>The fluid, featureless, boundless nature of the air and space environment makes the execution of airpower operations simple compared to that of surface forces.</p> |
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- Mass and maneuver: the speed with which air and space forces maneuver in three dimensions allows them to achieve mass faster than surface forces.

Airpower can employ mass and maneuver simultaneously.

The simultaneous employment of mass and maneuver by airpower creates tremendous leverage when applied against surface forces.

- Economy of force: because airpower assets are limited in number, their use against objectives secondary to larger campaign objectives must be considered carefully and evaluated by competent airmen.

The Joint Force Air Component Commander

1. The joint force air component commander controls airpower in a joint campaign.

- The JFACC derives authority from the joint force commander (JFC) who has the authority to exercise operational control, assign missions, direct coordination among subordinate commanders, redirect, and organize forces to ensure unity of effort in the accomplishment of the overall mission.
- The primary purpose for a JFACC is to provide unity of effort and employ the strengths of joint airpower for the benefit of the joint force as a whole.
- The JFACC normally will be the component commander having the preponderance of air assets and the best capability to control and direct joint air operations.

2. JFACC responsibilities are to integrate and employ air and space forces to meet the JFC's objectives.

- The JFC assigns the JFACC's responsibilities (normally these include, but are not limited to, planning, coordination, allocation, and tasking based of the JFC's apportionment decision).

- Based on the JFC's guidance and in coordination with the other component and supporting commanders, the JFACC recommends apportionment to the JFC.
 - Apportionment is the determination of the total expected air effort by percentage and/or priority that should be devoted to the various air and geographic operations.
 - Following the JFC apportionment decision, the JFACC allocates apportioned air sorties to the functions, areas, and missions they support.
- The JFACC is likely to be designated as the area air defense commander and airspace control authority.

3. The JFACC integrates air and space forces to meet the JFC's theater objectives.

- The JFACC's ability to integrate air assets may be limited by other components' direct air support requirements.
- Space power employment and control are retained by United States Commander-in-Chief, Space Command (USCINCSpace), who coordinates with the supported commander-in-chief (CINC).
- Joint and service doctrines and agreements give the JFACC control of only part of the available theater air assets.
- From an airman's perspective, components would make the following assets available in the absence of JFC guidance:
 - All USAF sorties.
 - Marine sorties for long-range interdiction, long-range reconnaissance, and air defense.
 - Naval air in excess of maritime air operations requirements.
 - Tactical land attack missile (TLAM) interdiction missions beyond Army boundaries.

- Army aviation and missile interdiction missions beyond Army boundaries.

4. Air campaign planning is integral to the success of the overall campaign.

- Campaigns are the major instruments theater commanders use to achieve strategic aims.
- Campaign plans allow theater commanders to set operational tempo, direct the conduct of battles, envision objectives, develop concepts, and coordinate logistics to achieve victory.
- Key tenets of the campaign plan are as follows:
 - Provide an orderly scheme of military operations.
 - Identify the enemy's center of gravity (e.g., leadership, national will, infrastructure, military).
 - Phase a series of related major operations that may overlap and need not be consecutive.
 - Provide operational direction and tasks to subordinates.
 - Synchronize air, land, and sea efforts into a cohesive and synergistic whole.

Space Power

1. Space power is the capability to exploit space to support national strategy and achieve national security objectives. National, Department of Defense (DOD), civil, and commercial space systems (with associated infrastructures) are used by the military to achieve national security objectives. These assets include space-based and ground-based launch systems and the people who operate, maintain, or support space systems.

2. The space missions are *force support, force enhancement, space control, and force application.*

- Force support includes on-orbit support for satellites.

Global Positioning System (GPS) operators at Falcon AFB, Colorado, ensured the availability of GPS satellites to supply navigation information to combat aircraft within the Kuwaiti Theater of Operations (KTO) half a world away.

- DOD, selected NASA, and allied satellite constellations are maintained through the Air Force Satellite Control Network (AFSCN).
- Telemetry, tracking, and command via worldwide ground stations allow for on-orbit maintenance.

Air Force Space Command crews operating the Defense Support Program (DSP) and other space systems provided timely warning to Coalition forces, allowing them to take shelter and don protective gear. The warning also enabled interception of Scuds.

- Force enhancement multiplies combat effectiveness with:
 - Surveillance: the DSP provides space-based missile warning.
 - Reconnaissance: the civil Landsat program provides land, surface, and ocean data.

Satellite controllers at Offutt AFB, Nebraska, furnished soil moisture data collected by Defense Meteorological Satellite Program (DMSP) and Landsat satellites to planners for identifying ingress routes used by ground forces to enable General Schwarzkopf's "left hook" maneuver.

- Communications: provides high-capacity, secure, and survivable communications for command, control, communications, computers, and intelligence (C⁴I).

Desert Shield C4I initially overwhelmed military communications. Space controllers at Falcon AFB acted quickly by moving a Defense Satellite Communications System (DSCS) II satellite from over the Pacific to above the KTO, vastly expanding available communications. This was the first satellite ever relocated to support US combat operations.
- Navigation: the Global Positioning System provides three-dimensional position and velocity information.

Air Force and Army helicopters, relying on GPS, destroyed key Iraqi early warning sites, opening a hole in Iraqi air defenses for Coalition aircraft. Combat aircraft used GPS to locate and target Iraqi military forces. Throughout the KTO, space operations produced direct combat effects.
- Meteorology: provides weather data for worldwide operations.

In Desert Shield and Desert Storm, the primary source of weather information was satellites.
- Spacelift: emplaces and replaces critical space assets.
- Space control is the ability to control the space combat environment.
 - It assures use of our own space systems while denying enemies the use of their space systems.
 - Three mission elements of space control are
 - - Space surveillance: monitor activities in space.

- - Protection: protect our space forces.
- - Negation: negate or terminate enemy space forces.
- Force applications in, or from, space equates to ballistic missile defense (BMD) planning. BMD, theoretically, is composed of a three-layered defense against strategic and theater ballistic missiles.
 - Technological advancements in lasers have created possibilities for airborne systems to target ballistic missiles.
- The first layer is boost: the period when the booster is thrusting.
- The second layer is midcourse/postboost: the phase when reentry vehicles (RV) “coast” along ballistic trajectories in space.
- The third layer is terminal: the period after RVs reenter the atmosphere.

3. Future concepts for space combat. Airmen must consider the increasing importance of space as the Air Force evolves from an air force to an air and space force to a space and air force.

- Space support and force enhancement. With the proliferation of space capabilities to third world countries, the United States must be prepared to defend and protect its space assets and the critical enhancements they provide.
- Space combat. While current national policy does not include space weaponry, consideration of expanding the battleground into space may be required. Such consideration could include a manned military presence aboard a space platform for command and control of space assets.
- Space denial. The conflict of the future will require control of all information flowing in and out of the theater. Disrupting the adversary’s decision cycle (by neutralizing his “eyes and ears” in space) provides unlimited advantage to friendly forces in shaping the battlefield.

- Space strike. Technology being the catalyst, future airmen must be cognizant that a “bolt from the blue” strike against any target may be possible from space-based weapons. Countering this threat could require basing offensive and defensive platforms in space.
- Space protection. New notification and protection systems are needed to ensure the survival of our high-value space assets. Advanced, survivable satellite detection and avoidance systems will negate adversarial attempts to disrupt or destroy friendly space systems.
- As potential adversaries gain access to space through their own systems or through third parties (other nations or commercial sources), the need to address hostile space activities increases.

Information Operations

1. Information operations adds a new brick to our foundation of capabilities. Information technology is pervasive and information is no longer an administrative function—rather it is a combat function. The combat environment is information intensive.

2. Information warfare is a developing philosophy that consists of targeting the enemy’s information and information functions while protecting our own. The intent of information warfare is to degrade the adversary’s will and capability to fight.

Information warfare is any action to deny, exploit, corrupt, or destroy the enemy’s information and its functions; protecting ourselves against those actions; and exploiting our own military information functions.

- Information warfare includes any attack against an information function, regardless of the means.

Bombing a telephone switching facility or destroying its software is information warfare.

- Information warfare encompasses any action to protect our information functions, regardless of means.

Hardening and defending a switching facility against physical attack or shielding its software with antivirus programs is information warfare.

- Information warfare is a means, not an end, in precisely the same manner that air warfare is a means, not an end.

Information warfare may be used to conduct attacks similar in nature to those conducted with physical systems (e.g., strategic attack or interdiction).

3. Traditional means of conducting information warfare include psychological operations (PSYOP), electronic warfare, military deception, physical attack, and various security measures.

- Psychological operations: use information to affect the enemy's reasoning.
- Electronic warfare: use electromagnetic and directed energy for both offensive and defensive applications.
- Military deception: mislead the enemy as to our capabilities or intentions.
- Physical destruction: convert stored energy to destructive power (e.g., explosives or the use of electromagnetic pulse devices to "fry" electronic components).

Traditional PSYOP as well as use of information systems.

Denies accurate information to the enemy by masking or misleading.

Traditional deception techniques as well as manipulation of information systems.

Physical attack using a range of weapons from conventional explosives to electromagnetic pulses.

- Security measures: keep adversary from learning our capabilities or intentions.

Operations security (OPSEC), communications security (COMSEC), and computer security (COMPUSEC).

4. The information age has provided new and practical means to deny, exploit, corrupt, or destroy information, as well as the vulnerabilities to make those attacks possible. Assaults on information are known as information attack.

- Information attack: directly corrupting information (data or instruction) without visible change to the physical entity it resides within.
- Indirect information warfare affects information by creating phenomena that the adversary will perceive, interpret, and act upon.
- Direct information warfare affects information through altering its components without relying on the adversary's powers of perception or interpretation.

A means of information warfare aimed at data or instructions.

Military deception (creating an alternative reality), physical attack (creating changes to conditions), and OPSEC (denying the enemy knowledge of friendly action) traditionally achieve their ends indirectly.

Since nearly all modern information systems are themselves controlled by information, attacks may be directed against any level. An example of direct attack would be altering the status of enemy forces within their information systems, thus producing confusion.